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| APPLICATION NO.      | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |  |  |
|----------------------|-------------|----------------------|---------------------|------------------|--|--|
| 10/559,555           | 04/03/2006  | Jurgen Gieshoff      | UMICORE 0153-US     | 5512             |  |  |
| 23719                | 7590        | 03/25/2009           | EXAMINER            |                  |  |  |
| KALOW & SPRINGUT LLP |             |                      | XU, XIAOYUN         |                  |  |  |
| 488 MADISON AVENUE   |             |                      | ART UNIT            |                  |  |  |
| 19TH FLOOR           |             |                      | PAPER NUMBER        |                  |  |  |
| NEW YORK, NY 10022   |             |                      | 1797                |                  |  |  |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

|                              |                        |                     |  |
|------------------------------|------------------------|---------------------|--|
| <b>Office Action Summary</b> | <b>Application No.</b> | <b>Applicant(s)</b> |  |
|                              | 10/559,555             | GIESHOFF ET AL.     |  |
|                              | <b>Examiner</b>        | <b>Art Unit</b>     |  |
|                              | ROBERT XU              | 1797                |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

1) Responsive to communication(s) filed on 06 March 2009.  
 2a) This action is FINAL.                    2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

4) Claim(s) 1-19 is/are pending in the application.  
 4a) Of the above claim(s) 13-19 is/are withdrawn from consideration.  
 5) Claim(s) \_\_\_\_\_ is/are allowed.  
 6) Claim(s) 1-12 is/are rejected.  
 7) Claim(s) \_\_\_\_\_ is/are objected to.  
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

|  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____ .                                    |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>12/02/2005</u> .  | 6) <input type="checkbox"/> Other: _____ .                        |

## DETAILED ACTION

### ***Election/Restrictions***

1. Applicant's election with traverse of group I, Claims 1-12 in the reply filed on 03/06/2009 is acknowledged. The traversal is on the ground(s) that no search burden is met, because claims in Group I and II both involve determining the activity and the ageing behavior of a catalyst. This is not found persuasive because the apparatus as claimed in group II requires additional devices, such as temperature sensors and heat exchangers that are not recited in the group I.

The requirement is still deemed proper and is therefore made FINAL.

Claims 1-19 are pending of which Claims 13-19 are withdrawn from consideration. Claims 1-12 are considered on merits.

### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. **Claim 1** is rejected under 35 U.S.C. 102(b) as being anticipated by et al. (US 2001/0054281, IDS) (Adams).

In regard to Claim 1, Adams teaches a method of determining activity and aging behavior of a catalyst by producing a first substream combustion offgases by a first combustion process and a stream of hot combustion offgases having a defined pollutant composition by mixing the first substream of hot combustion offgases with the second substream (additional exhaust gas or contaminant by a contaminant supplier 266), passing the combustion offgases over the catalyst to be tested and determining the pollutant conversions effected by the catalyst (250) (see paragraph [0030] [0034] and [0037], Figure 4-5). Adam teaches that the second substream is “additional exhaust gas”, which implies that the second substream is produced by a second combustion process.

***Claim Rejections – 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. **Claims 2-7 and 9-12** are rejected under 35 U.S.C. 103(a) as being unpatentable over Adams et al. (US 2001/0054281, IDS) (Adams).

In regard to Claim 2, Adam does not specifically teach that the first substream of hot combustion offgases makes up from 60 to 95% of the total mass flow of the two substreams. Adam teaches that the second substream of hot combustion offgases is the minor substream in the mixture of the two substreams (see paragraph [0037]). Therefore, the first substream of hot combustion offgases makes up from 60 to 95% of the total mass flow of the two substreams is inherent or obvious based on Adam's teaching.

In regard to Claim 3, Adam teaches that the first substream of hot combustion offgases is produced by burning a motor fuel in a first stream of combustion air (see paragraph [0030] [0034]). Adam does not explicitly teach that the second substream of hot combustion offgases is produced by burning gaseous hydrocarbons in a second stream of combustion air. Since Adam teaches that the second substream of hot combustion offgases is different from the first one (see paragraph [0037]), it must be produced by burning fuels other than motor fuel. Gaseous hydrocarbons have been

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conveniently used as domestic fuels for cooking and heating. At the time of the invention it would have been obvious to one of ordinary skill in the art to produce the second substream of hot combustion offgases by burning gaseous hydrocarbons in a second stream of combustion air, because gaseous hydrocarbons is a convenient fuel to use.

In regard to Claim 4, Adam teaches that air to fuel ratio exceeding about 15.5 are similarly possible, with ratios of about 17 and even about 18 or greater possible (see paragraph [0046]). That means the first substream of hot combustion offgases has an air ratio lambda of greater than 1.

In regard to Claim 5, Adam does not specifically teach that ammonia or aqueous ammonia is introduced into the first and/or second stream of combustion air in order to increase the nitrogen oxide concentration in the combustion offgases. Adam teaches that contaminant can be added to the exhaust gas flow (see paragraph [0047]). Nitrogen oxide is one of the contaminants found in exhaust gas. Ammonia oxidizes to nitrogen oxide. At the time of the invention, it would have been obvious to ordinary skill in the art to add ammonia as contaminant in to the stream of combustion air as taught by Adam in order to increase the nitrogen oxide concentration in the combustion offgases.

In regard to Claim 6, Adam teaches that contaminant can be added to the exhaust gas flow (see paragraph [0047]). Poisoning elements in the form of precursor compounds are contaminants that could damage the catalyst. It would have been obvious to ordinary skill in the art to add the poisoning elements as contaminant to the motor fuel as taught by Adam to test the catalyst aging.

In regard to Claim 7, Adam teaches that the air to fuel ratio can be adjusted in a very wide range (7 to 18) (see paragraph [0046]). Adam also teaches that the second substream of combustion offgases is a minor component of the two streams used to adjust the composition of the offgases (see paragraph [0037]). Which means the air ratio lambda of the second substream of combustion offgases can be set to a wide range, from 0.5 to more then 1. Even lambda of 3 is reasonably possible because the second substream is a minor substream in the combustion offgases.

In regard to Claim 9, Adam teaches that any contaminant commonly found in exhaust gases can be added into the second substream of combustion (see paragraph [0037]). One kind of the contaminants commonly found in exhaust gases of engine is the incompletely oxidized hydrocarbons. Therefore, at time of the invention it would have been obvious to ordinary skill in the art to add hydrocarbons which is difficult to oxidize into the gaseous hydrocarbons to test the catalyst as taught by Adam.

In regard to Claim 10, Adam teaches that the temperature of the first substream of combustion offgases is reduced to a value by passing through a heat exchanger (230) before it is mixed with the second substream of combustion offgases (see paragraph [0037], Figure 5). Adam further teaches that the system has the capability to maintain the exhaust gas in a range as shown in Figure 9. In Figure 9, the temperatures of some of the test sample are maintained in a range between 200 to 800°C (see Figure 9).

In regard to Claim 11, in addition to hydrocarbons that has been discussed above, Adam also teaches that oil additives (ZDP) or further gaseous or vaporizable components (any contaminants commonly found in exhaust gas) can be added to the mixed combustion offgases before they are brought into contact with the catalyst (see paragraph [0037]).

In regard to Claim 12, Adam teaches that the temperature of the mixed combustion offgases is set to a defined value before contact with the catalyst (see paragraph [0034]).

7. **Claim 8** is rejected under 35 U.S.C. 103(a) as being unpatentable over Adams in view of Neeft et al. (Fuel, 1997) (Neeft).

In regard to Claim 8, Adam does not specifically teach that water is introduced into the second stream of combustion air in order to avoid soot formation in the case of extremely rich operating conditions. Neeft teaches the influence of water on the rate of oxidation of soot. Neeft teaches that water causes a significant increase in oxidation rate of the flame soot, which accompanied by an increase in reaction order in carbon and a much higher CO<sub>2</sub>/CO ratio (see abstract). Since the second substream is the offgases by burning gaseous hydrocarbons, adding water into the second stream of

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combustion air will reduce the formation of soot in the case of extremely rich operation conditions based on Neeft's teaching. Therefore, it would have been obvious to ordinary skill in the art to introduce water into the second stream of combustion air in order to avoid soot formation in the case of extremely rich operating conditions.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ROBERT XU whose telephone number is (571)270-5560. The examiner can normally be reached on Mon-Thur 7:30am-5:00pm, Fri 7:30am-4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill Warden can be reached on (571)272-1267. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

3/14/2009

/Yelena G. Gakh/  
Primary Examiner, Art Unit 1797

RX